THE TASK ANALYSIS GUIDE

Memorization Task

- Involve reproducing previously learned facts, rules, formulae, or definitions to memory.
- Cannot be solved using procedures because a procedure does not exist or because the6 time frame in which the task is being completed is too short to use procedure.
- Are not ambiguous-such tasks involve exact reproduction of previously seen material and what is to be reproduced is clearly and directly stated.
- Have no connection to the concepts or meaning that underlie the facts, rules, formulae, or definitions being learned or reproduced.

Procedures with Connections Tasks

- Focus students' attention on the use of procedures for the purpose of developing deeper levels of understanding of mathematical concepts and ideas.
- Suggest pathways to follow (explicitly or implicitly) that are broad general procedures that have close connections to underlying conceptual ideas as opposed to narrow algorithms that are opaque with respect to underlying concepts.
- Usually are represented in multiple ways (e.g., visual diagrams, manipulatives, symbols, problem situations). Require some degree of cognitive effort. Although general procedures may be followed, they cannot be followed mindlessly. Students need to engage with the conceptual ideas that underlie the procedures in order to successfully complete the task and develop understanding.

Procedures without Connections Tasks

- Are algorithmic. Use of the procedure is either specifically called for or its use is evident based on prior instruction, experience, or placement of the task.
- Require limited cognition demand for successful completion. There is little ambiguity about what needs to be done and how to do it.
- Have no connection to the concepts or meaning that underlie the procedure being used.
- Are focused on producing correct answers rather than developing mathematical understanding.
- Require no explanations, or explanations that focus solely on describing the procedure that was used.

Doing Mathematics Tasks

- Require complex and no algorithmic thinking (i.e., there is not a predictable, well-rehearsed approach or pathway explicitly7 suggested by the task, task instructions, or worked-out example).
- Require students to explore and understand the nature of mathematical concepts, processes, or relationships.
- Demand self-monitoring or self-regulation of one's own cognitive processes.
- Require students to access relevant knowledge and experiences and make appropriate use of them in working through her task.
- Require students to analyze the task and actively examine task constraints that may limit possible solution strategies and solutions.
- Require considerable cognitive effort and may involve some level of anxiety for the student due to unpredictable nature of the solution process required.

Stein, Mary Kay; Smith, Margaret; Henningsen, Marjorie; Silver, Edward. (2009). *Implementing Standard-based Mathematics Instruction.* New York, NY: Teachers College Press